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LOADSTAR LETTER #19

February 1995 Companion newsletter for LOADSTAR #129
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Jeff Finds Bug In C-64's Floating Point Routines. Is No Computer Safe?

While balancing my checkbook, I re-discovered a little-known bug that exists in BASIC V2, but is "automatically" fixed by any program that rounds to the nearest hundredth. Nevertheless the sum depicted above, 67.72999999, is absolutely incorrect. The

```
**** COMMODORE 64 BASIC V2 ****
64K RAM SYSTEM 38911 BASIC BYTES FREE

READY.
PRINT 431.01-24.87-21.37-5.59-11.45-300

67.72999999
READY.
█
```

Figure 1.1: The bug in action

correct answer should be 67.73. Frankly, I don't know why the bug exists. It was explained to me once, and it went straight over my head. All I cared about was avoiding the bug, which is simple. I use a one-line algorithm that rounds to the nearest cent, which is a staple in any programmer's arsenal.

The point of sharing this is I think all the hoopla over the Pentium bug is a bit forced. Programmers know that the bug exist, and will program around it. The problem is defeated now, even in the so-called bad chips. Intel is getting a raw deal. Most every major chip has had bugs in it. Some of these devices are as complex as small cities. It's near impossible to make an emulate microprocessor. Even the 6502 has one bug that I can immediately think of. That is indirect JMPing with pointers straddling a page boundary. Programs and, yes, operating systems, all have some bugs in them.

Again, since the bug is now known, programmers will avoid it from now on. How many times has your checkbook program reported 67.7299999?

I can only wonder what agitated the snarling, the gnashing of teeth and threats of lawsuits have been agitated by the competition. Frankly, the death blows to the Pentium were

the Power PC chip, which *vastly* out-performs it, and Pentiums overheating problems. So I'll continue to take pot shots at the Pentium, but not its FPU.

Freak Magnetic Storm Lands Entire LOADSTAR Letter in Jeff's Email Box. Jeff Takes Vacation

I was pleasantly surprised to receive the following articles from John Elliot. Er, This is the Canadian John Elliot, Not the Yank John Elliot, who makes the user port reset switches. I now turn the entire LOADSTAR LETTER over to John Elliot. I hope to do this again!

Real Time Clocks and Performance Peripherals

Date and Time Stamping. Several years ago my daughter was in charge of a university ms-dos computer lab. She asked me if the C-64/128 had date and time stamping. After she explained that she meant that the directory listing would show the time and date when the file was saved, I told her that we did not have that feature.

It took some reflection to decide why this would be a useful application. I include the date with the return address of my letters. I have to load the file however, to learn its date. I do write several versions of any paper or article I am working on. Time and date stamping would tell me the sequence of my drafts. Sometimes useful information exists in an earlier graphic or text file which is removed in later versions. I include the sequence in the name under which a file is saved. This does limit the amount of information that I can place in the directory name. With most graphics and some text files several versions are saved in the same session. To indicate the order of these same day files, I would need to include time and date in the label of the file. The sequence in the directory does not by itself show the order of saves since saving takes place to empty locations. Because of scratching etc., these spaces might be anywhere in the directory.

Messages I upload to a bulletin board do

not have an address or date and would benefit from date and time stamping. Several Commodore programs do show time. The Write Stuff tells you how much time has elapsed while the keyboard is used. The Final Cartridge tells how long the cartridge has been powered up. Many terminal programs allow the setting of the time of day.

I only know of two programs which display the time and date: GEOS and Big Blue Reader 128.

The GEOS Clock. GEOS has a combined clock/calendar function. Although I had manually set the clock each time I loaded GEOS, I couldn't see the point of including the calendar information. Recently I discovered that when I open the information accessory of GEOS, it tells me the date and time when the file was saved -- if I have correctly set the clock/calendar before saving. I do have for GEOS time and date stamping. Each time I start a GEOS session, though, I must re-enter the clock/calendar information.

Battery Backed Clocks

MS-DOS computers have a battery powered "real time clock" which stamps each file when it is saved. It is "real time" in the sense that the real time and date, rather than elapsed time, is shown. While some configurations require running an update application each time the computer is turned on, most automatically update the clock when the computer is turned on.

Commodore History

Due to Commodore's penny pinching, this was not included with the C-64/128. Some third party manufacturers have developed an external battery powered clock. Mystic Jim, six years ago sold among other GEOS material, a real time clock. I have not seen his advertisements for several years. Jason- Ranheim until recently produced the \$70 CCSZ clock/calendar. It was recommended for long term data acquisition, industrial control systems and such applications as ringing classroom bells. It provided automatic program boot from battery backed RAM or disk and automatic time and date stamping of disk files. Its creator told me he had stopped selling it because "Anyone who is going to buy it already has."

The CMD Real Time Clock. CMD has approached a real time clock in two ways. If you own a

RAMLink or one of their floppy drives, you may purchase a \$30 RTC option for automatic setting of the GEOS device. It will also time and date stamp any file saved to a CMD drive, even if it is not a GEOS file. Their new \$50 mouse contains the RTC. It will automatically set the GEOS clock/calendar and place the time and date information in the info application. The mouse RTC has no effect on non GEOS files.

The PPI Real Time Clock. Performance Peripherals (PPI), has developed an inexpensive (\$20) real time clock/calendar. The RTC is a one inch cube with two small horns for grasping when inserting it into joystick port two. Like the CMD mouse RTC, it only stamps GEOS files. A short BASIC program supplied by PPI will read and display the time and date from the clock. Since the PPI clock is accessible from BASIC, I imagine that any programmer could call it from within a program. I have placed the basic program in my Quick Brown Box non-volatile ram cartridge so that it is available when I use other box programs. With my Write Stuff word processor, this amounts to a terminate and stay resident situation since whatever I was typing in TWS remains there while I leave my document, access the clock, and return to what I was writing.

Four programs are provided on disk to control the clock. One sets the clock from basic. One reads it from basic. Two are GEOS related. One sets the RTC from GEOS while the other sets the GEOS clock from the RTC. Each program uses clear, simple prompts.

The GEOS clock/calendar automatically will show the correct time and date if the appropriate RTC program is placed on the boot disk. If GEOS is booted from a ram expansion unit it will be necessary to open the RTC program in the REU for the correct time and date to automatically appear. When I load GEOS from disk, the time and date are immediately visible from the desktop. My 2 megabyte PPI ram cartridge takes about two seconds to display the correct time and date once the program is opened.

Big Blue Reader 128

Other than GEOS, the only Commodore program that I am aware of which uses date and time stamping is the 128 version of The Big Blue

Reader. When saving to an MS-DOS disk, BBR 128 version 4.0 uses the 128 time of day clock to set or change the time. The MS-DOS directory will display this. PPI has sent a RTC to SOGWAP, the creator of BBR, in the hope that upgrades may make use of the clock.

Purchasing Decisions. Outside of GEOS, RTC is for me an interesting but not very useful novelty. The ability to automatically have an accurate time and date for all GEOS files does however expand my possibilities. I no longer need to title the files saved to include the date, or manually update the GEOS clock. I will find this useful when I begin to wonder which file is the newer one or how long ago I wrote a letter.

The fact that the clock is battery supported means that I can remove the clock from the port in order to use a mouse with Runpaint. Like the famous bunny, the clock keeps on ticking. Power outages will not affect time and date information either.

PPI is well known for providing low cost alternatives to products which sometimes exceed the cost of a computer. Since I already have a 1351 mouse, I cannot justify the purchase of the CMD SmartMouse, which includes an RTC. It is also possible that some programmers outside the GEOS world will adapt their products to use the PPI RTC. If I were interested in real world interface control (turning lights on and off by computer, etc.), I think this product might be quite useful.

Many Commodore users will find the combination of the 2 megabyte BBG Ram battery and AC backed GEOS cartridge from PPI with their real time clock to be all they need for their computing environment for a combined price of well under \$200. I will purchase the RTC for my occasional use but am keeping my fingers crossed that programmers will find additional uses for this very inexpensive device.

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[Jeff's Note: CMD Floppy drives, HDs units and RAMLinks will stamp the time and date on *all* files created, regardless of the program used. I use the time directory, @\$=T, to find my latest version of source files all the

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time. The devices come with GEOS auto exec files that set the time from the CMD device's RTC. Now, back to my vacation.]

The 8-Bit Commodore's Historic Role In Industry

BY JOHN ELLIOT. Games and word processing may be the primary home uses for our C-64/128's. For many years our computers have had a wider but less recognized role in personal, professional, industrial and military usage in North America. These uses have been examples of using existing hardware and software in innovative ways, and in discovering ways of using our computers never considered by Commodore.

The Military-Industrial Establishment. Jason Ranheim has produced cartridges for a range of industries which interface C-64/128's for testing or control with commercial technologies. They briefly described for me a number of uses to which our machines have been put in the past decade. General Motors first used the Vic-20, then the C-64 for testing during product development and production. Xerox, which developed the predecessor of the Macintosh and Windows graphic environments, did most of its testing with C-64/128's. The internal systems of some hotels are operated by Commodores. The American military, for target practice both with lasers and conventional arms, has used our computers. In Atlanta the shuttle trains which run between terminals were controlled first by Vic-20s and then by C-64s. Jason Ranheim developed for Commodores because it was so easy to interface control cartridges. They stopped sales of these products when Commodore stopped making the c128 which had the minimum necessary hardware for their cartridges.

When Learjet sold a large number of executive jets, they ran their entire operation with C-64s. They developed a Learjet flight simulator which used the same parameters as bombers. The US Air Force bought them to train pilots.

Ham radio operators in my town are still using Vic-20s and C-64s with cartridges which translate Morse code into English. Since they are no longer commercially available, these hobbyists periodically dismantle and reassemble them for maintenance.

Ted Seitz, the editor of The Write Stuff newsletter, has a friend who operates a laser printing service. The friend takes his C-64 and laser printer to the corporations and prints on site. He took the name off his computer. When asked what computer he is using, he tells them it's a Macintosh clone. They then believe it will be able to do the job.

The Sky's the Limit? Margaret Wendall and her brother-in-law, Art, developed programs for their Commodores which show what the sky would look like in different historical periods. At the start of the 1980s they used a Texas Instrument programmable calculator. When they obtained a Vic-20 they were able to see what was entered before calculations began. Although slow, the printout was on real, rather than thermal paper. While their C-64 which they now use is also slow, it allows longer programs. Using Run Magazine's Datafile, (now from CMD), they put 4400 stars into 22 files. While their astronomy program is the commercially developed Skytravel, they made their maps with HES' Graphics Basic. It can plot cylindrical, stereographic, orthographic and polar projections and rotate on all axes. They found that there was no IBM graphics basic or parallel of Datafile.

Helping the Handicapped. Two features of The Write Stuff word processor have assisted disabled typists. Although Rolfe Schell has a partially paralyzed left arm, he is able to type with two fingers of his right hand. He can however type forty words per minute with the use of word macros. With this computer aided facility he is also able to run a publishing house with twelve authors, and write twelve books on his own. He handles the periodic Florida summer blackouts by keeping his word processor and document in the non-volatile Quick Brown Box.

The speaking version of TWS is called BB Talker. It was developed by a special education teacher who was frustrated by the poor sound quality and high price of an Apple II speech synthesizer. Bob Smith used BB Talker on a C-64 in a school for the blind in Naples Italy. Although the school moved to Milan after he left, the children are still enthusiastic users of the program.

The Educated Commodore. Robert Hunter a teacher in Windsor Newfoundland is also a user of BB Talker. The greeting each morning for his grade five class is created by the teacher with this synthesizer. When students compose plays, they prepare written and oral versions with different voices.

Gordon Jeffries in Wentworth Nova Scotia operates the four C-64s in his grade six with one disk drive. Three of his computers use Quick Brown Boxes containing Speedscript. The computer which is attached to a disk drive is used when a composition is to be saved to disk, and to load other programs into the QBB.

ENG and the C-64. At the beginning of the 1990s Jan Frajkor at Carleton University in Ottawa Ontario taught his electronic news gathering class with a Commodore equipped television newsroom. His eight C-64s were supported by three networked drives and two printers. Two drives held news and data while one contained programs and administration. The reporter would type a story with a word processor containing a sample story with built in production directions. Desk editors would load in a run sheet to list story sequences. They were able to create charts and graphs, and with a video out, store the results for editing into pre-taped stories. A commercially designed teleprompter program enabled news readers to read the stories on air.

Color Output From Monochrome Printers

BY JOHN ELLIOT. Sometimes our computers and peripherals can produce results for which they were not designed. Earl Walter prints multi colored pictures using multiple passes of a different color each time. He feels that this saves his color change mechanism on his color printer and gives better control of shading. In his B-Bug newsletter Ted Seitz pointed out that this process will also work with a monochrome printer and single colored ribbons. It works most easily with printers such as the Star series which allow a reverse line feed function. With my Homewriter Ten I manually rewind the platen for each color change.

Gazette and my Walkman

BY JOHN ELLIOT. BB Talker with an audio line out from my C-64 to my cassette recorder allows me to

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go for a run while listening to Tom Netsel's editorial, or any other article from this magazine. When a text file is loaded into BB Talker, it can be set to read aloud anything from a letter or word to the entire document. Connecting the line out on my computer to the line in on my cassette permits taping of the C-64's audio output. The sound is mechanical and about 90% decipherable on a word for word basis. The remaining 10% is clear from context. These limitations are true of voice synthesizers on most platforms. Tape length is limited by the shortness of C-64 files- about 3000 words. If I had a 128 I would be able to use files of twice that length. In either case I can listen to Gazette while running or driving my car. [Jeff's post-mumble: Say, what's wrong with LOADSTAR articles?]

The Computer Coloring Book

Hugh McMenamin creates coloring books for his grandchildren using a video camera and digitizer such as Videobyte or The Final Cartridge III. The preferably full page size image is taped by the camera, digitized and saved to disk. It is then converted to a commodore graphics program such as Doodle or Geopaint. Similar effects can be achieved with the Handyscanner or less expensive 4-scan. While videotape and digitizers more faithfully handle line drawings, I find the 4-scan device is best at reproducing images with a range of tones. The \$300 Handyscanner is likely excellent in both respects.

The Potential Of The C-64/128

Our Commodores would require only software support to perform the "leading edge" tasks enthusiastically described in magazines dedicated to the Macintosh and MS-DOS platforms.

Computer Shopper several years ago in its "Orphans" section described a shareware hypertext program for the then long extinct Adam computer. If a machine with the limited features of the Adam could provide a hypertext environment, there is no reason that our Commodores could not make full use of this random access multimedia programming environment. Although the IBM clones have access to some hypertext programs, the graphical environment interface and hypertext programming have been the principal advantages of the Macintosh.

Cd-rom is beginning to supplement if not replace disk storage for commercial software on the more expensive computers. Several years ago I saw an advertisement in a British Commodore magazine which described a cable to link a standard cd player to a C-64. A compact disk was included which contained public domain versions of arcade games. At the time I had wished that they had instead placed reference works on the disk, since the games were not an attractive factor. Their pixels would not work on North American monitors in any event, because of the different television formats. Although this may have been vaporware, one wonders if the same system could be used to provide us with enormous reference data bases for dictionaries, encyclopedia, baseball statistics, etc. Alternatively, both the Swiftlink rs-232 interface and most CMD drives would provide an alternative way of connecting with existing cd-rom drives, if the appropriate software were written for the interfaces.

Commodore users are ignored by many corporate members of "the information highway". While we are welcomed by Genie and Q-Link, we are excluded from

some important networks. To directly access Internet in Nova Scotia I must use a Mac or IBM front end on a machine with appropriate memory. Advertisements for America on Line indicate that they use a proprietary interface that will only work on a sufficiently powerful IBM or Mac. If I can run my 80 column Geoterm from a 2 megabyte non-volatile ramdisk, there should be software available to give me entrance to all computer networks.

There is currently no fax modem software for the C-64/128. CMD's Swiftlink RS-232 interface cartridge allows an ibm modem of any speed to run from a Commodore. CMD ships software to allow our computers to recognize these modems. Two years ago CMD was approached by programmers who wished to develop and distribute software that would allow a fax modem to work on a Commodore. Even if optical character recognition was not part of the package, and what was transmitted was page images rather than characters, it would be an enormous improvement over my fax machine. I would be able to print to plain paper, and send from and store to disk. This would also allow inexpensive high quality scanning, since a faxed image received by our computer could be manipulated in a number of ways by paint and graphics programs. To my knowledge this enormously complex programming challenge has not been completed. A project which for at least two years has been partly completed is Eric Lee's The Write Stuff Publisher. It would have the graphics, text and titles on each page printed at maximum resolution. Fonts would be scalable. This means that each letter would be free of "jaggies" no matter how large or small it was printed. A printer such as any in the Star series, which could be programmed to back up the page for overprinting would be required. Eric has written the core hi-res printing routines, but is still determining which features to include before he continues.

Much has been accomplished with the Commodore 64/128 which many of us either had not thought of, or had assumed was impossible. A great deal could still be done in the areas described if the programming effort were made. Eric Lee for one is motivated by the challenge of doing something that isn't supposed to be possible. He doubts if there would be a profit in TWS Publisher. Commercial developers have given up on us because they don't see a profit in our small market. Peter Fiset accomplished a hardware hack that I had been told by major developers was impossible when he developed a low priced powered backup for the REU. When I last talked with him, he had not made a profit on his device. We might encourage development in the areas I have described if we purchased some of the products these innovators already have produced. We could also write to LOADSTAR and the developers encouraging their continued work.

Many of us could be equally creative in alternative uses of the Commodore equipment which we do have.

While I have talked with or exchanged letters with many of the people mentioned, frequently I first heard about their efforts through B-Bug, the users group newsletter for The Write Stuff word processor. I read about the Carleton University newsroom in Run Magazine and then was lucky enough to meet one of Professor Frajkor's students. Many Gazette readers from similar sources would have equally interesting stories to tell which would bring my response that "I didn't know you could do that with a C-64/128!"